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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,274	10/30/2000	Shinya Yamaguchi	520.39251X00	6630

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EXAMINER

ABRAHAM, FETSUM

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 05/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/698,274

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Fetsum Abraham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-13, 16-18 and 26-34 is/are pending in the application.
- 4a) Of the above claim(s) 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10, 12, 13, 16-18 and 27-34 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-915) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Claims rejection

1. The request for clarification by applicant in response to the action of March, 14, 02 has been acknowledged and a new restriction requirement issued in paper no. 8 to further clarify the grouping of all claims in the application. Although there may not have been statements to indicate there was request for clarification, the request, however, has been effectively addressed by the following action in paper no. 8. For more clarification, the elected claims are 1-7, 9-12, 16-18, 26, 31-34. However, the last action in paper No. 8 has clearly indicated that claim 26 was classified in group II while the response in claim 9 does not reflect that. This action does not include claim 26 as it belongs to group II. Please contact the examiner as soon as possible if there is any problem with the classification. The non elected claims have been withdrawn from consideration.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30,31 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MEP. § 2172.01. The omitted structural cooperative relationships are: "gate type elements formed at said semiconductor thin film..", and "each semiconductor elements having a gate electrode separated from.." can not be understood as presented because gate electrodes are always formed on gate insulation layers and not at a semiconductor films. Based on this definition, the second statement contradicts the first since it

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somewhat defines a commonly known gate structures in the art. Further, it is not clear if said elements are the gates themselves or other structures associated with the gates.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3,34 are rejected under 35 U.S.C. 102(a) as being anticipated by Yamazaki et al (6,348,368).

The patent discloses a crystallized active transistor layer with grains joined by (111) twin boundaries (see column 14, 42-67). Clearly, a gate electrode is mounted on the active layer via gate insulation layer.

As for claim 2, almost all grains in the thin film layer are substantially in (110) orientation (see column 9, 60-65). Clearly, thin films are formed on the surface of an insulating layer.

As for claim 3, all TFTs have source/drain regions and the crystallized layer is commonly the active channel region.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 4-7,9,10,12,16-18,30-33, so far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Owyang et al (6,060,375).

The prior art discloses all subject matter but a polysilicon active layer crystallized by an agent from group IV elements (see column 2, 45-50). Therefore, it would have been obvious to one skilled in the art to use such elements to crystallize the active layer of the TFT of Yamazaki, since group IV elements are as good conductors as the typically used conductors.

As for claims 5,10,33, since currents in TFTs travel through the channel, it is clear that the currents of the cited TFTs must also travel through the crystal grain boundaries of (111) twin of diamond structure.

As for claims 6,16, the crystallizing agents of Yamazaki are oriented parallel to the substrate. As for the claimed layer thickness, layer dimension is notoriously known as one of the most common variables that differ from a design to another based on an expected result. Therefore, it is not patentable. Besides, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). As for the mobility of the active layer, the element is again variable and heavily dependent on doping profile and concentration of crystallizing agents. Therefore, it is clear that the claimed amount of mobility alone can not be patented.

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As for claims 7,12, the crystal grains in the active layers of the cited references are not restricted to a defined number. Therefore, it is clear that the claimed number of crystals is also covered in the references. As for one structure on the polysilicon active layer in claim 7 is concerned, both TFTs have gate insulation structures on the active layers. As for said one point in claim 12, the crystals are finally connected to one another forming a larger crystal in such active layers.

As for claim 9, although the exact terminologies as that of the claim such as “dendryte” is not used, it is clear that there are crystallized regions in the active layer of the prior arts. As for the amorphous layer containing crystallizing agents, crystallized layers are originally amorphous and metal agents are usually introduced to such layers in order to crystallize.

As for claim 17, the active layers of the cited references are formed on an insulating substrate.

As for claim 18, TFTs are the main switches and drivers in LCDs. Therefore, the TFTs of the cited references are compatible with the technology.

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The vertical and parallel orientations in the claim of the crystals and the claimed angles are the reason for the action.

Any inquiry concerning this communication should be directed to Fetsum Abraham

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at telephone number (703) 305,3793, or by Fax, at (703) 746,4125, or by E-mail at

fetsum.abraham@uspto.gov.

Any inquiry of a general nature or relating to the status of this application should be directed to the *SPE of AU:2826* at (703)308-6601, or the *Group receptionist* at (703) 308-0956.

Fetsum Abraham

4/22/02


FETSUM ABRAHAM
PRIMARY EXAMINER